

COVER CROPS FOR MANAGEMENT OF ROOT-KNOT NEMATODES

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Crop rotation has long been used as an important nonchemical practice for nematode management. Any crop (including weeds) or agricultural practice can potentially affect nematode populations in a particular site. Cover crops grown for forage or soil improvement may impact nematodes as well. In some cases, certain cover crops may be used deliberately to suppress nematodes (McSorley, 1998; Rodriguez-Kabana et al., 1989). Cover crops often affect different species of nematodes in different ways, increasing populations of some species while decreasing others. When multiple species of nematodes are present, it is important to focus on the key nematode pests, which in many systems are the root-knot nematodes (*Meloidogyne* spp.).

A number of cover crops are known to be suppressive to individual species of root-knot nematodes, and cultivars of some crops are suppressive to more than one *Meloidogyne* spp., including castor (*Ricinus communis*), oat (*Avena sativa*), sorghum (*Sorghum bicolor*), crotalaria (*Crotalaria spectabilis*), sunn hemp (*C. juncea*), velvetbean (*Mucuna pruriens*), and various grasses.

The susceptibility of several cover crops to populations of *Meloidogyne arenaria* race 1, *M. incognita* race 1, and *M. javanica* was investigated in a recent series of greenhouse experiments (McSorley, 1999). Castor, 'Iron Clay' cowpea (*Vigna unguiculata*), crotalaria, and American jointvetch (*Aeschynomene americana*) were resistant to all three nematode populations. Marigold (*Tagetes minuta*), 'Paloma' sesame (*Sesamum indicum*), and 'Tropic Sun' sunn hemp performed as well as the resistant crops, although trace amounts of nematodes occurred on a few plants. Japanese millet (*Echinochloa frumentacea*) was susceptible to all three nematodes, and results with a pearl millet (*Pennisetum typhoides*) varied with the nematode species. Nematode-resistant cultivars of legumes such as jointvetch, cowpea, and sunn hemp may have potential for nematode management as well as nitrogen management.

Effects from suppressive rotation crops are typically short-lived, with nematodes recovering following a season of a susceptible crop. In a recent field experiment (McSorley et al., 1999), numbers of *M. incognita* following summer cover crops of marigold, 'Iron Clay' cowpea, or browntop millet (*Panicum ramosum*) ranged from 34-71 per 100 cm³ soil, less ($P \leq 0.05$) than the 429/100 cm³ present in control plots, but more ($P \leq 0.05$) than the 2/100 cm³ in solarized plots. *Meloidogyne incognita* was suppressed initially in a fall tomato crop that followed the cover crops, but numbers recovered by the end of the susceptible fall crop. Root-knot nematodes damaged a spring crop of susceptible tomato, but not a resistant cultivar. Effective use of cover crops for nematode management requires a knowledge of the nematodes present and the susceptibility of any crops to be used. Although inferior to solarization or soil fumigation, the performance of cover crops against nematodes may be improved by combining them with other methods, such as the use of nematode-resistant vegetable crops.

References Cited

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